

Akari[®]

Miticide/Insecticide

Technical Information

Spider mites are some of the most serious arthropod pests in ornamentals production not only because they cause severe damage on crops but also because they readily can develop resistance to acaricides (miticides). Unfortunately, growers are confronted with the fact that there are resistance problems, to one degree or another, associated with several conventional acaricides. Additionally, intensive use of synthetic pyrethroids can cause resurgence in pest mite populations.

In order to address these problems, much research has been focused on the development of a new acaricide. Fenpyroximate was discovered in 1985 and was first introduced in Asia and Europe in 1991. Fenpyroximate belongs to the Phenoxyprazole group, has a novel chemical structure, and has been proven effective against most phytophagous (plant-eating) mites on various crops world wide.

SePRO Corporation has signed an agreement to market fenpyroximate as the trademarked miticide, Akari, formulated as a 5% suspension concentrate. Akari 5SC is registered for use in greenhouses and other structures with an impermeable roof. Label expansions planned include outdoor, indoor ornamental plantings, and interior plantscape uses. Numerous research trials initiated by SePRO Corporation have shown Akari to be highly effective against spider mites with no observed phytotoxicity to the ornamental crops tested. Akari provides excellent knockdown of mites and residual control lasting 21-28 days.

Biological Mode of Action

Akari's mode of action is primarily as a contact miticide. It is effective on all stages of two-spotted spider mite and is most effective on larvae followed by nymphs, adults and eggs. Akari is a mitochondrial electron transport inhibitor (METI). When the active ingredient, fenpyroximate, comes in contact with target mites, it blocks cell respiration causing the pest to lose motor control and collapse. In addition to this contact activity, Akari provides cumulative mortality at each successive life stage through inhibition of molting as is seen with insect growth regulators.

Efficacy and Residual Control

Activity of Akari on early immature stages (larvae and protonymphs) is 10-100 times higher than that of conventional acaricides such as Kelthane T&O. Akari activity on early immature stages is similar to that of Hexygon and has greater than 1500-times Hexygon's activity against adult mites. When proper coverage is achieved, Akari consistently provides control for three weeks or more, even under hot, dry conditions that favor mite development.

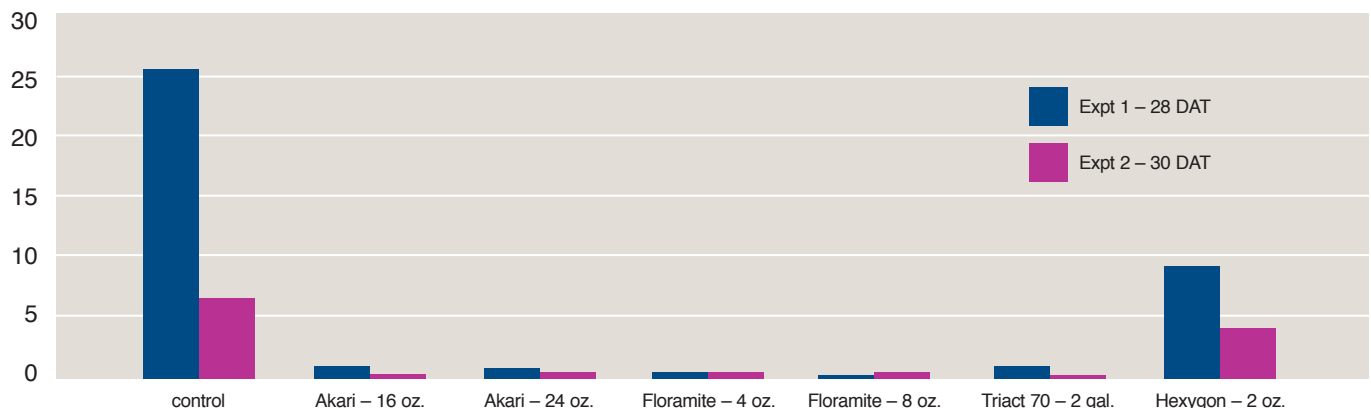


Figure 1. Number of motile two-spotted spider mites per 4 chrysanthemum leaves following miticide applications 28 days (Expt. 1) and 30 days (Expt. 2) after treatment (rates are per 100 gallons of spray). J.F. Price, Gulf Coast Research & Education Center, University of Florida, Bradenton, Summer 2000.

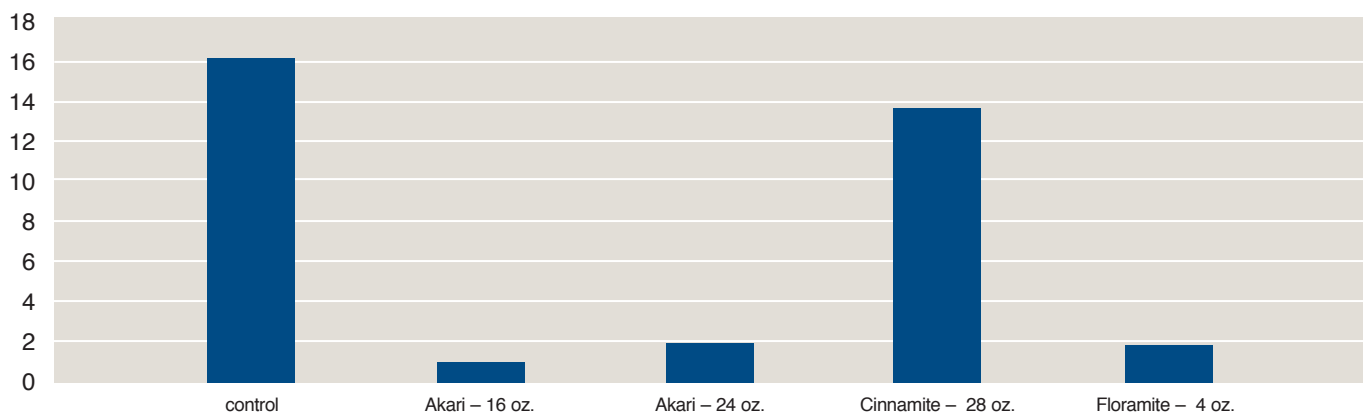


Figure 2. Number of motile two-spotted spider mites per 1-inch² of ornamental sweet potato leaves following miticide applications 21 days after treatment (rates are per 100 gallons of spray). J.R. Baker & E. Reeves, North Carolina State University, Sept. 2000.

Stop-Feeding Action

While many of the newer acaricides claim quick knockdown, Akari goes one important step further. Prior to knockdown and death, mites treated with Akari become paralyzed on the leaf or while spinning down from the plant using their webbing. This is in contrast to many other products that cause treated mites to walk off the leaves. The paralysis and spin-down behavior elicited by Akari translates to an immediate cessation of feeding. Not only do these characteristics of Akari minimize crop damage from feeding, it further curtails egg-laying by adult females. Mite management is elicited immediately after application by halting feeding damage and preventing new mite populations. A good evaluation of performance can generally be made 4-7 days after treatment with Akari. By this time, paralyzed adults and immature mites are dead and eggs have hatched or will hatch shortly. Newly-hatched mites contact the Akari residue and die within a few days. In this way, multiple generations of spider mites are controlled by one application of Akari.

Gentle to Crops and Beneficials

Akari has been tested at a 3x rate on several bedding, pot, and foliage crops as well as more than 30 cut rose cultivars and shows no phytotoxicity. Akari is relatively gentle to natural enemies and beneficials showing little adverse effect on: lacewing, ladybug, parasitic wasps, predacious spiders, Orius sp. predator, Scolothrips predator, and Amblyseius longispinosus predator mites. Research investigating toxicity to adult Phytoseiulus persimilis predator mites has shown compatibility with dry residue and moderate toxicity by wet spray. Field trials conducted in California showed a strong rebounding of pre-existing P. persimilis populations after 14 days post-application, indicating low mortality to eggs and other immature stages. "It's going to fit into the persimilis program," says Alan Mitchell, General Manager of California Pajarosa cut rose operation in Watsonville, California. "It knocked down mites enough that they didn't recover and the persimilis did. Akari is going to work well in an IPM program."

Compatibility, Rotation and General Use

Akari persists under sunlight and overhead irrigation and provides rapid action under high temperatures. Akari is believed to be compatible with most commonly used fungicides, insecticides, micronutrients, growth regulators, and spray adjuvants. As with any acaricide, Akari should be used only in a rotational program with other miticides to provide season-long protection. Do not apply Akari in successive applications in the same greenhouse. Akari belongs to a new, advanced class of chemistry and has shown no resistance with other acaricides. However, Akari shares a similar (METI) mode of action with Sanmite[®]. To avoid development of cross-resistance, do not use successive rotations between Akari and Sanmite. Akari works primarily through contact action, so good spray coverage is essential. Dense foliage or excessive growth will often prevent adequate coverage; adjust spray volumes accordingly. Under severe mite conditions, use the maximum rates and a shorter spray interval. For best results, treat plants when pests are immature and populations are building, and make no more than two applications of Akari per growing season, or per crop cycle, whichever is longer.

Akari 5SC Miticide/Insecticide was granted "Reduced-Risk" designation and a 12-hour REI. Use rates range from 16-24 fluid ounces of product per 100 gallons of spray. The 5SC formulation contains 0.42 pounds of fenpyroximate per gallon. Akari received approval for federal registration on September 27, 2000. Most states are currently registered for its use.